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A Hybrid Approximation Bayesian Test of Variance Components for Longitudinal Data

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Abstract

The test of variance components of possibly correlated random effects in generalized linear mixed models (GLMMs) can be used to examine if there exists heterogeneous effects. The Bayesian test with Bayes factors offers a flexible method. In this article, we focus on the performance of Bayesian tests under three reference priors and a conjugate prior: an approximate uniform shrinkage prior, modified approximate Jeffreys' prior, half-normal unit information prior and Wishart prior. To compute Bayes factors, we propose a hybrid approximation approach combining a simulated version of Laplace's method and importance sampling techniques to test the variance components in GLMMs.

Key words：Bayes factor; Generalized linear; Jeffreys' prior; Laplace approximation; Uniform shrinkage prior; Unit-information prior